The thesis focuses on -hypernuclear production induced by K meson stopped at an atomic orbit. Calculations are performed within the framework of the distorted wave impulse approximation. We use a microscopic model based on chiral perturbation theory for the description of the elementary kaon-nucleon process. The use of the microscopic model is one of the assets of the present work. Another novelty is a proper treatment of the pion distortion in the eective nucleon density available for the reaction. We consider several kaon-nucleus and pion-nucleus potentials. We study various eects on the capture rate of the reaction. We compare our results with experimental data and with previous calculations. Although our results are closer to the experimental values then the results of previous authors, the agreement with experiment is still unsatisfactory.